<u>Amendments to the Claims</u>

This listing of claims will replace all prior versions, and listings, of claims in the application:

<u>Listing of Claims:</u>

1.   (Currently Amended)   A method for admission control in a cellular telecommunication system[, the method] comprising <u>the</u> steps [in which] <u>of:</u>

<u>receiving</u> [-] a bearer request [is received (105), and];

<u>checking</u> [-] current load [is checked (110),];

[characterized in that the method further comprises steps, in which]

<u>calculating</u> [-] a <u>preliminary</u> [result] load estimate [is calculated (115)] based at least on the current load and said bearer request[;]; and

[-] if said <u>preliminary</u> [result] load estimate is lower than a [first predefined] <u>predetermined</u> limit, <u>performing the steps of:</u>

<u>admitting</u> said bearer request [is admitted (125),];

<u>allocating</u> transmission resources [are allocated (130)] according to said request[;]; and

<u>checking</u> the resulting load [is checked (135)]; [and] <u>or</u>

[-] if said <u>preliminary</u> [result] load estimate is <u>higher</u> [larger] than said [first predefined] <u>predetermined</u> limit, <u>performing the step of:</u>

<u>attempting the</u> [releasing] <u>release</u> of transmission <u>capacity</u> resources <u>of the cellular telecommunication system</u> [is attempted (122)] in order to bring <u>the resulting</u> [a] load [estimate] under said [first] <u>predetermined</u> limit <u>thereby</u> [for] allowing admittance of said requested bearer.

2.   (Currently Amended)   <u>The</u> [A] method according to claim 1, [characterized in that as a response to] <u>wherein if, after performing the steps of allocating transmission resources and</u> [said] checking [of] the resulting load <u>when the preliminary load estimate is lower than the predetermined limit,</u> [if] the resulting load is larger than said [first] predetermined limit, <u>the method further comprises the step of:</u>

<u>modifying</u> the parameters of at least one bearer [are modified (145)] in order to bring the resulting load under said [first] predetermined limit.

3. (Currently Amended) The [A] method according to claim 1, wherein, [characterized in that] after said step of attempting the release of transmission capacity resources when the preliminary load estimate is higher than the predetermined limit, the method further comprises the steps of:

    checking [-] the current load [is checked (165),];

    calculating [-] a resulting load estimate [is calculated (167)] based at least on the current load and the bearer request[,]; and

    [-] if said resulting load estimate is lower than the [a first predefined] predetermined limit, performing the steps of:

        admitting the bearer request [is admitted (180),];

        allocating transmission resources [are allocated (130)] according to said request[,]; and

        checking the resulting load [is checked (135)].

4. (Currently Amended) The [A] method according to claim 3, wherein [characterized in that as a response to said checking of the resulting load], if the resulting load is larger than said [first] predetermined limit, the method further comprises the step of:

    modifying the parameters of at least one bearer [are modified (145)] in order to bring the resulting load under said [first] predetermined limit.

5. (Currently Amended) The [A] method according to claim 1, wherein [characterized in that if said result load estimate is over said first predefined limit,] the step of attempting the release of transmission capacity resources comprises the steps of:

    modifying [-] the bearer request [is modified (160) for lowering] to thereby lower the amount of resources required by the request[,];

    checking [-] current load [is checked (165),];

    calculating [-] a resulting load estimate [is calculated (167)] based at least on the current load and said modified bearer request[,]; and

    [-] if said resulting load estimate is lower than [a first predefined] the predetermined limit, performing the steps of:

admitting said modified bearer request [is admitted (180),];

allocating transmission resources [are allocated (130)] according to said modified

bearer request[;]; and

checking the resulting load [is checked (135)].

6. (Currently Amended) The [A] method according to claim 5, wherein [characterized in that as a response to said checking of the resulting load], if the resulting load is larger than said [first] predetermined limit, the method further comprises the step of:

modifying the parameters of at least one bearer [are modified (145)] in order to bring the resulting load under said [first] predetermined limit.

7. (Currently Amended) The [A] method according to claim 1, wherein [characterized in that] said step of attempting the release of transmission capacity resources comprises the step of:

adjusting [(155)] handover control parameters of the cellular network.

8. (Currently Amended) The [A] method according to claim 1, wherein [characterized in that] said step of attempting the release of transmission capacity resources comprises the step of :

adjusting [(150)] power control parameters of the cellular network.

9. (Currently Amended) The [A] method according to claim 1, wherein [characterized in that] said step of attempting the release of transmission capacity resources comprises the step of :

adjusting [(151)] load control parameters of the cellular network.

10. (Currently Amended) The [A] method according to claim 1, wherein [characterized in that] said step of attempting the release of transmission capacity resources comprises the step of :

adjusting [(152) of] soft handover and/or soft capacity margins of the cellular network.

11. (New) The method according to claim 3, wherein, if the resulting load is larger than said predetermined limit, the method further comprises the step of:

rejecting the bearer request.

12. (New) The method according to claim 3, wherein, if the resulting load is larger than said predetermined limit, the method further comprises the step of:

scheduling the bearer request for later action.

13. (New) The method according to claim 4, wherein the at least one bearer is the requested bearer.

14. (New) The method according to claim 1, wherein said step of attempting the release of transmission capacity resources comprises the step of :

selecting at least one cellular network parameter or at least one type of cellular network parameter to modify.

15. (New) The method according to claim 14, wherein the selecting step is performed according to a criteria dependent on the requirements of the particular application.

16. (New) The method according to claim 14, wherein the selecting step is performed according to the amount the preliminary load estimate exceeds the predetermined limit.

17. (New) The method according to claim 14, wherein the selection is random.

18. (New) The method according to claim 14, wherein cellular network parameters which do not substantially affect a type of bearer are preferentially selected.

19. (New) The method according to claim 18, wherein parameters affecting non-real-time bearers are modified before parameters affecting real-time bearers.

20. (New) The method according to claim 14, wherein power control parameters, load control parameters, soft handover margins, soft capacity margins, handover control parameters, and/or parameters of the bearer request comprise types of cellular network parameters.

21. (New) The method according to claim 14, wherein said step of attempting the release of transmission capacity resources further comprises the steps of:

> modifying the selected at least one cellular network parameter or type of cellular network parameter;
>
> checking the current load;
>
> calculating a resulting load estimate based at least on the current load and the bearer request; and
>
> if said resulting load estimate is lower than the predetermined limit, admitting the bearer request.

22. (New) The method according to claim 21, wherein, if said resulting load estimate is higher than the predetermined limit, said step of attempting the release of transmission capacity resources further comprises the step of:

> selecting, again, at least one cellular network parameter or type of cellular network parameter to modify.

23. (New) The method according to claim 22, wherein a type of cellular network parameter is selected in the steps of selecting, and said step of selecting, again, at least one cellular network parameter or type of cellular network parameter to modify comprises the steps of:

> determining whether all available types of parameters have been modified; and
>
> if all have not been modified, selecting a type of parameter to modify from a group consisting of types of parameters which have not been modified.

24. (New) The method according to claim 23, wherein, if all available types of parameters have been modified, the method further comprises the step of:

> denying the bearer request.

25. (New) The method according to claim 1, wherein said step of attempting the release of transmission capacity resources comprises the step of:

> modifying a first type of cellular network parameter;

wherein power control parameters, load control parameters, soft handover margins, soft capacity margins, handover control parameters and/or parameters of the bearer request comprise types of parameters.

26. (New) The method according to claim 25, wherein said step of attempting the release of transmission capacity resources further comprises the steps of:

checking the current load;

calculating a resulting load estimate based at least on the current load and the bearer request; and

if said resulting load estimate is lower than the predetermined limit, admitting the bearer request.

27. (New) The method according to claim 26, wherein, if said resulting load estimate is higher than the predetermined limit, said step of attempting the release of transmission capacity resources further comprises the step of:

modifying a second type of parameter.

28. (New) The method according to claim 1, wherein the current load, preliminary load estimate, and the resulting load are determined for a control area, said control area being a region of the cellular telecommunication system controlled by an admission control entity.

29. (New) The method according to claim 28, wherein said control area comprises a sector of a cell, a cell, a plurality of cells, a routing area, and/or an entire radio access network.

30. (New) The method according to claim 28, wherein a transmission load capacity of the control area has a stable load region, within which the system can handle all traffic, a critical load region above the stable load region, and an overload region above the critical load region.

31. (New) The method according to claim 30, wherein the critical load region is used as a soft capacity margin for the control area.

32. (New) The method according to claim 30, wherein the predetermined limit is the upper limit of the stable load region.

33. (New) The method according to claim 28, wherein the preliminary load estimate is calculated in terms of transmission power capacity in the control area.

34. (New) The method according to claim 33, wherein the step of calculating a preliminary load estimate comprises the step of:

calculating $P_{req} + P_{oc}$

where P_{req} = transmission power of the requested bearer

P_{oc} = transmission power of existing bearers in the control area;

wherein the preliminary load estimate is lower than the predetermined limit when the following condition is met:

$$P_{req} + P_{oc} \leq P_{stable}$$

where P_{stable} = the upper limit of a stable load region for the control area.

35. (New) The method according to claim 1, wherein the transmission resources comprise radio resources, logical resources, codes, and/or transmission capacity.

36. (New) The method according to claim 7, wherein the handover control parameters comprise parameters which define thresholds for triggering a handover from one cell to another.

37. (New) The method according to claim 8, wherein the power control parameters comprise an upper limit and/or a lower limit of transmission power margins of existing connections.

38. (New) The method according to claim 10, wherein the step of adjusting soft handover and/or soft capacity margins comprises the step of:

adding or deleting a branch of an existing bearer.

39. (New) The method according to claim 1, wherein the step of receiving a bearer request comprises the step of:

receiving, by an admission control entity, a bearer request message.

40. (New) The method according to claim 39, wherein the step of checking current load comprises the steps of:

transmitting, by the admission control entity, a message requesting load information to a load control entity; and

receiving, by the admission control entity, a message comprising current load information from the load control entity.

41. (New) The method according to claim 40, wherein the step of admitting the bearer request comprises the step of:

transmitting, by the admission control entity, an acknowledgment message to a bearer management entity.

42. (New) The method according to claim 2, wherein the step of modifying the parameters of at least one bearer in order to bring the resulting load under the predetermined limit comprises the step of:

transmitting, by an admission control entity, a message to a power control entity, wherein said message comprises an instruction to change at least one power control parameter.

43. (New) The method according to claim 2, wherein the step of modifying the parameters of at least one bearer in order to bring the resulting load under the predetermined limit comprises the step of:

transmitting, by an admission control entity, a message to a handover control entity, wherein said message comprises an instruction to change at least one handover control parameter.

44. (New) The method according to claim 7, wherein the step of adjusting power control parameters of the cellular network comprises the step of:

> transmitting, by an admission control entity, a message to a power control entity, wherein said message comprises an instruction to update at least one power control parameter.

45. (New) The method according to claim 44, wherein the step of adjusting power control parameters of the cellular network further comprises the step of:

> receiving, by the admission control entity, an acknowledgment message from the power control entity; and
>
> checking, by an admission control entity, a current load.

46. (New) The method according to claim 1, wherein said step of attempting the release of transmission capacity resources comprises the step of :

> negotiating, by an admission control entity, with a bearer management entity in order to reduce the resources required by the requested bearer.

47. (New) The method according to claim 2, wherein said step of modifying the parameters of at least one bearer in order to bring the resulting load under said predetermined limit comprises the step(s) of:

> negotiating, by an admission control entity, with a bearer management entity in order to reduce the resources required by the requested bearer; and/or
>
> negotiating, by the admission control entity, with the bearer management entity in order to reduce the resources required by one or more bearers other than the requested bearer.

48. (New) The method according to claim 1, wherein the cellular telecommunication system comprises at least one mobile station having a multidiversity connection.

49. (New) The method according to claim 48, further comprising at least one of the following steps:

setting, by an admission control entity, a bit error rate for outer loop power control;

setting, by the admission control entity, a frame error rate for outer loop power control; and/or

setting, by the admission control entity, initial signal-to-noise setpoints for outer loop power control.

50. (New) The method according to claim 48, further comprising the step of:

setting, by an admission control entity, a power margin for transmission power of a multidiversity bearer of the mobile station having a specified quality of service.

51. (New) The method according to claim 50, further comprising the step of:

making, by the mobile station, a final transmission power adjustment decision.

52. (New) The method according to claim 51, wherein, in said step of making the final transmission power adjustment decision, the mobile station decides to increase transmission power only when the increased power level is equal to, or smaller than, a predetermined upper limit for the transmission power of the connection, and if the increased transmission power is within said power margin for the transmission power.

53. (New) The method according to claim 52, wherein said step of making the final transmission power adjustment decision is performed, when the outer loop power control commands demand an increase of the power level, by the mobile station according to the following condition:

$$P_{trx} = P_o + DSS \leq P_{max} \in P_{margin}$$

where P_{trx} = transmission power after increase

P_o = current transmission power

DSS = dynamic step size to be added to current level

P_{max} = said predetermined upper limit for transmission power

P_{margin} = said power margin set by the admission control entity.

54. (New) The method according to claim 51, wherein, in said step of making the final transmission power adjustment decision, the mobile station decides to decrease transmission power only when the decreased power level is equal to, or larger than, a predetermined lower limit for the transmission power of the connection, and if the decreased transmission power is within said power margin for the transmission power.

55. (New) The method according to claim 54, wherein said step of making the final transmission power adjustment decision is performed, when the outer loop power control commands demand a decrease of the power level, by the mobile station according to the following condition:

$$P_{trx} = P_o - DSS \geq P_{min} \in P_{m\arg in}$$

where P_{trx} = transmission power after increase

P_o = current transmission power

DSS = dynamic step size to be subtracted from current level

P_{min} = said predetermined lower limit for transmission power

P_{margin} = said power margin set by the admission control entity.

56. A cellular telecommunication system comprising:

an admission control entity for controlling admissions of new bearers in a control area of the cellular telecommunication system, wherein, when said admission control entity receives a bearer request, said admission control entity checks a current load in the control area and calculates a preliminary load estimate based at least on the current load and said bearer request;

wherein, if said preliminary load estimate is lower than a predetermined limit, said bearer request is admitted and transmission resources of the control area are allocated according to said request, after which the admission control entity checks the resulting load in the control area; and

wherein, if said preliminary load estimate is higher than said predetermined limit, the admission control entity attempts to release transmission capacity resources of the control area in order to bring the resulting load under said predetermined limit thereby allowing admittance of said requested bearer.

57. The cellular telecommunication system according to claim 56, further comprising:

a bearer management entity for managing bearers in the control area, for transmitting a bearer request message to the admission control entity, for receiving an acknowledgment message from the admission control entity, and for admitting the bearer of the bearer request based on the received acknowledgment message.

58. The cellular telecommunication system according to claim 56, further comprising:

a load control entity for controlling the transmission capacity of the control area, for receiving a query message from the admission control entity, and for transmitting a message bearing information about the current load to the admission control entity based on the received query message.

59. (New) The cellular telecommunication system according to claim 58, wherein the admission control entity transmits said query message at least whenever a new bearer request is received or a new bearer is admitted.

60. The cellular telecommunication system according to claim 56, further comprising:

a power control entity for controlling power levels of mobile stations and base stations in the control area, for receiving an update message from the admission control entity after a new bearer has been admitted, for updating power levels to account for the changed transmission environment based on said update message, for receiving a command message from the admission control entity indicating that at least one power control parameter should be adjusted, and for transmitting an acknowledgment message to the admission control entity indicating that either a command message or an update message was received from the admission control entity.

61. (New) The cellular telecommunication system according to claim 60, wherein the admission control entity transmits said command message at least when it is attempting to release transmission capacity resources of the control area in order to bring the resulting load under said predetermined limit thereby allowing admittance of said requested bearer.

62. The cellular telecommunication system according to claim 56, further comprising:

a handover control entity for controlling handovers between cells when a mobile station moves from one cell to another, for receiving an update message from the admission control entity after a new bearer has been admitted, for updating handover control parameters to account for the changed transmission environment based on said update message, for receiving a command message from the admission control entity indicating that at least one handover control parameter should be optimized, and for transmitting an acknowledgment message to the admission control entity indicating that either a command message or an update message was received from the admission control entity.

63. (New) The cellular telecommunication system according to claim 62, wherein the admission control entity transmits said command message at least when it is attempting to release transmission capacity resources of the control area in order to bring the resulting load under said predetermined limit thereby allowing admittance of said requested bearer.

64. A mobile station in a cellular telecommunication system, wherein an admission control entity of a present control area within which said mobile station is located in the cellular telecommunication system sets a power margin for transmission power of a multidiversity bearer of the mobile station having a specified quality of service, comprising:

means for making a final transmission power adjustment decision;

whereby the mobile station decides to increase transmission power only when the increased power level is equal to, or smaller than, a predetermined upper limit for the transmission power of the connection, and the increased transmission power is within said power margin for the transmission power; and

whereby the mobile station decides to decrease transmission power only when the decreased power level is equal to, or larger than, a predetermined lower limit for the transmission power of the connection, and the decreased transmission power is within said power margin for the transmission power.

65. (New) The mobile station according to claim 64, wherein said final transmission power adjustment decision is made, when the outer loop power control commands demand an increase of the power level, according to the following condition:

$$P_{trx} = P_o + DSS \le P_{max} \in P_{margin}$$

where P_{trx} = transmission power after increase

P_o = current transmission power

DSS = dynamic step size to be added to current level

P_{max} = said predetermined upper limit for transmission power

P_{margin} = said power margin set by the admission control entity.

66. (New) The mobile station according to claim 64, wherein said final transmission power adjustment decision is made, when the outer loop power control commands demand a decrease of the power level, according to the following condition:

$$P_{trx} = P_o - DSS \ge P_{min} \in P_{margin}$$

where P_{trx} = transmission power after increase

P_o = current transmission power

DSS = dynamic step size to be subtracted from current level

P_{min} = said predetermined lower limit for transmission power

P_{margin} = said power margin set by the admission control entity.

67. (New) The mobile station according to claim 64, wherein the admission control entity of the cellular telecommunication system sets at least one of a bit error and/or frame error rate for outer loop power control, and/or initial signal-to-noise setpoints for outer loop power control.

68. (New) A method for admission control in a control area of a cellular telecommunication system comprising the steps of:

whenever a request for the admittance of a new bearer is received, estimating a result of the admittance of the new bearer on the available capacity of the control area;

if the estimated results show that a stable load capacity threshold will not be exceeded by

the admittance of the new bearer, admitting said bearer and allocating transmission resources according to said request;

whenever a new bearer is admitted, determining an actual result of the admittance of the new bearer on the available capacity of the control area; and

if either (i) the estimated results show that the stable load capacity threshold will be exceeded by the admittance of the new bearer, or (ii) the determined actual results show that the stable load capacity threshold was exceeded by the admittance of the new bearer, manipulating at least one cellular telecommunication system parameter of the control area in order to bring the load resulting from said manipulation under said stable load capacity limit.

69. (New) The method according to claim 68, wherein said step of estimating the result of the admittance of the new bearer on the available capacity of the control area comprises the step of:

determining a probability that a load comprising existing bearers and the requested bearer would exceed a predetermined system reliability limit.

70. (New) The method according to claim 69, wherein said probability that the load comprising existing bearers and the requested bearer would exceed the predetermined system reliability limit is determined according to the requirement that:

$$PROB(C_{oc} \geq C_{tot}) \leq \gamma$$

where $PROB$ = probability

C_{oc} = capacity occupied by bearers

C_{tot} = total capacity of said control area

γ = predetermined system reliability limit.

71. (New) The method according to claim 70, wherein the capacity is measured and/or determined based on signal-to-interference ratios (SIRs).

72. (New) The method according to claim 70, wherein the capacity is measured and/or determined based on transmission power in the control area.

73. (New) The method according to claim 68, wherein said step of estimating the result of the admittance of the new bearer on the available capacity of the control area comprises the step of:

> determining whether an estimated load comprising existing bearers and the requested bearer would exceed a predetermined system capacity limit.

74. (New) The method according to claim 73, wherein said step of determining whether an estimated load comprising existing bearers and the requested bearer would exceed the predetermined system capacity limit is determined according to the requirement that:

$$P_{req} + P_{oc} \leq P_{stable}$$

> where P_{req} = transmission power of the requested bearer
>
> P_{oc} = transmission power of existing bearers in the control area;
>
> P_{stable} = the upper limit of a stable load capacity for the control area.

75. (New) The method according to claim 68, wherein said step of manipulating at least one cellular telecommunication system parameter comprises the step of:

> manipulating at least one cellular telecommunication system parameter of a real-time bearer.

76. (New) The method according to claim 68, further comprising the step of:

> if (i) the requested bearer is an emergency call, and (ii) if the estimated results show that a critical load capacity threshold will not be exceeded by the admittance of the new bearer, admitting said bearer and allocating transmission resources according to said request.

77. (New) The method according to claim 68, wherein said step of manipulating at least one cellular telecommunication system parameter comprises the step of:

> maintaining a priority hierarchy among requested and existing bearers such that higher priority bearers are affected less than lower priority bearers when at least one cellular telecommunication system parameter is manipulated.

78. (New) The method according to claim 77, wherein real time bearers of emergency calls have high priority, real time bearers have middle priority, and non-real time bearers have low priority.

79. (New) The method according to claim 68, wherein said step of manipulating at least one cellular telecommunication system parameter comprises the step of:

    manipulating at least one cellular telecommunication system parameter within a type of cellular telecommunication system parameter.

80. (New) The method according to claim 79, wherein the type of cellular telecommunication system parameter comprises one of handover control parameters, power control parameters, load control parameters, soft handover and/or soft capacity margins, and parameters of the requested bearer.

81. (New) The method according to claim 79, wherein said type of cellular telecommunication system parameter is predetermined.

82. (New) The method according to claim 81, wherein said step of manipulating at least one cellular telecommunication system parameter comprises the steps of:

    manipulating at least one cellular telecommunication system parameter of a first predetermined type;

    estimating a result of the admittance of the new bearer on the available capacity of the control area, said available capacity having changed because of the manipulation of the at least one cellular telecommunication system parameter;

    if the estimated results show that a stable load capacity threshold will not be exceeded by the admittance of the new bearer, admitting said bearer and allocating transmission resources according to said request; and

    if the estimated results show that the stable load capacity threshold will be exceeded by the admittance of the new bearer, manipulating at least one cellular telecommunication system parameter of a second predetermined type.

83. (New) The method according to claim 79, wherein said step of manipulating at least one cellular telecommunication system parameter within a type of cellular telecommunication system parameter comprises the step of:

> selecting the type of cellular telecommunication system parameter within which is the at least one cellular telecommunication system parameter.

84. (New) The method according to claim 83, wherein the type is selected based on an amount the stable load capacity threshold was exceeded.

85. (New) The method according to claim 83, wherein the type is selected at random.

86. (New) The method according to claim 83, wherein said step of selecting the type of cellular telecommunication system parameter comprises the step of:

> selecting the type of cellular telecommunication system parameter based on a priority hierarchy among requested and existing bearers so that higher priority bearers are affected less than lower priority bearers when at least one cellular telecommunication system parameter is manipulated.

87. (New) The method according to claim 83,

> wherein said step of selecting the type of cellular telecommunication system parameter comprises the step of:

>> selecting a first type of cellular telecommunication system parameter;

> wherein said step of manipulating at least one cellular telecommunication system parameter comprises the step of:

>> manipulating at least one cellular telecommunication system parameter of the selected first type;

>> estimating a result of the admittance of the new bearer on the available capacity of the control area, said available capacity having changed because of the manipulation of the at least one cellular telecommunication system parameter;

if the estimated results show that a stable load capacity threshold will not be exceeded by the admittance of the new bearer, admitting said bearer and allocating transmission resources according to said request; and

if the estimated results show that the stable load capacity threshold will be exceeded by the admittance of the new bearer, selecting a second type of at least one cellular telecommunication system parameter to be modified.

88. (New) The method according to claim 68, wherein said control area comprises a sector of a cell, a cell, a plurality of cells, a routing area, and/or an entire radio access network.

89. (New) The method according to claim 68, wherein the stable load capacity threshold is an upper limit of transmission load capacity of a stable load region within which the system can handle all traffic.

90. (New) The method according to claim 89, wherein a critical load region above the stable load region and below an overload region is used as a soft capacity margin.